

WHAT IS CLAIMED IS:

1. An improved filter assembly for a circuit breaker comprising:
a generally rectilinear filter housing having at least two filter mounting zones for receiving at least two filter assemblies, so as to define, in the aggregate, a filter assembly;
5 and
at least two filter assemblies configured for interfitting with said filter mounting zones of said filter housing, each said filter assembly comprising a generally rectilinear filter body having a given peripheral configuration and a filter gasket configured for interfitting about a periphery of said filter body for sealingly engaging said filter body
10 relative to said filter housing in response to forces encountered by said filter assembly both upon assembly and in operation.
2. The assembly of claim 1 wherein said filter gaskets are comprised of a silicone material.
3. The assembly of claim 1 wherein each of said filter bodies has a peripheral recessed portion for positioning, mounting and bearing against a complementary edge portion of said filter gasket.
4. The filter assembly of claim 3 and further including:
a small hole diffuser having a peripheral configuration similar to the peripheral configuration of said filter bodies, in the aggregate, when assembled with said filter housing and configured for interfitting within said filter housing, superimposed over said filter assemblies;
20 a spacer interposed between said filters and said small hole diffuser; and
a molded coarse hole diffuser, defining a combined diffuser and spacer integrally molded as a single, one-piece unit, said coarse hole diffuser including means for engaging and interfitting with said filter housing in close overlying engagement with said small hole diffuser.
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5. The assembly of claim 4 wherein said coarse hole diffuser further includes means for cooperatively interfitting with a plurality of arc plates of an arc diffuser plate

assembly, including means for locating and engaging said coarse hole diffuser relative to said arc plate assembly and means for engaging and maintaining a plurality of plates of said arc plate assembly in parallel and spaced apart condition.

5 6. The assembly of claim 1 wherein said filter housing comprises a frame-like, one-piece molded member having a recessed area for receiving each of said filter elements and an associated gasket therewithin, including separate areas for cooperatively interfitting with and bearing against edges of said gaskets opposite edges thereof bearing against said filter elements, and a projecting frame-like peripheral portion extending
10 outwardly for surrounding engagement with said filter elements, said spacer and said small hole diffuser.

 7. The assembly of claim 6 wherein said coarse hole diffuser further includes a peripheral flange at least along portions of a periphery thereof for engaging with and
15 seating relative to a complementary peripheral flange portion of said filter housing.

 8. The assembly of claim 5 in combination with a circuit breaker housing and arc stack, and further including complementary projections and slots formed respectively on said arc stack, said coarse hole diffuser and said breaker housing for positioning and
20 maintaining said arc stack and said filter assembly in assembled relation within said breaker housing, including maintaining compression on said gaskets and maintaining constant assembly force upon said assembly, equalizing compression loading of said gaskets and providing final positioning of the arc stack and filter assembly into the breaker case.

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 9. A molded coarse hole diffuser for a filter assembly for use with a circuit breaker, said molded coarse hole diffuser comprising:
 a combined diffuser and spacer integrally molded as a single, one-piece unit, said coarse hole diffuser including means for engaging and interfitting with a filter housing in
30 close overlying engagement with a small hole diffuser.

10 The diffuser of claim 9 wherein said coarse hole diffuser further includes means for cooperatively interfitting with a plurality of arc plates of an arc diffuser plate assembly, including means for locating and engaging said coarse hole diffuser relative to said arc plate assembly and means for engaging and maintaining a plurality of plates of
5 said arc plate assembly in parallel and spaced apart condition.

11 The diffuser of claim 9 wherein said coarse hole diffuser further includes a peripheral flange at least along portions of the periphery thereof for engaging with and seating relative to a complementary peripheral flange portion of said filter housing.

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12 The diffuser of claim 11 in combination with a circuit breaker housing and arc stack, and further including complementary projections and slots formed respectively on said arc stack, said coarse hole diffuser and said breaker housing for positioning and maintaining said arc stack and a filter assembly in assembled relation within said breaker
15 housing, including maintaining compression on said gaskets and maintaining constant assembly force upon said assembly, equalizing compression loading of said gaskets and providing final positioning of the arc stack and filter assembly into the breaker case.

13 A circuit breaker assembly comprising:
20 a filter assembly comprising:
 a generally rectilinear filter housing having at least two filter mounting zones for receiving at least two filter assemblies, so as to define, in the aggregate, a filter assembly;
 and

 at least two filter assemblies configured for interfitting with said filter mounting
25 zones of said filter housing, each said filter assembly comprising a generally rectilinear filter body having a given peripheral configuration and a filter gasket configured for interfitting about a periphery of said filter body for sealingly engaging said filter body relative to said filter housing in response to forces encountered by said filter assembly both upon assembly and in operation;

30 a small hole diffuser having a peripheral configuration similar to the peripheral configuration of said filter bodies, in the aggregate, when assembled with said filter

housing and configured for interfitting within said filter housing, superimposed over said filter assemblies;

a spacer interposed between said filters and said small hole diffuser; and

a molded coarse hole diffuser, defining a combined diffuser and spacer integrally
 5 molded as a single, one-piece unit, said coarse hole diffuser including means for engaging and interfitting with said filter housing in close overlying engagement with said small hole diffuser.

14. The assembly of claim 13 in combination with a circuit breaker housing
 10 and an arc stack, and further including complementary projections and slots formed respectively on said arc stack, said coarse hole diffuser and said breaker housing for positioning and maintaining said arc stack and said filter assembly in assembled relation within said breaker housing, including maintaining compression on said gaskets and maintaining constant assembly force upon said assembly, equalizing compression loading
 15 of said gaskets and providing final positioning of the arc stack and filter assembly into the breaker case.

15. A method of filtering high energy arcing in a circuit breaker comprising:
 mounting at least two filter assemblies with a generally rectilinear filter housing
 20 having at least two filter mounting zones so as to define, in the aggregate, a filter assembly; and

sealingly engaging said filter body relative to said filter housing in response to forces encountered by said filter assembly both during assembly and in operation.

16. The method of claim 15 wherein said sealingly engaging includes
 25 interfitting a filter gasket comprised of a silicone material with each filter element.

17. The method of claim 16 wherein said sealing includes positioning
 peripheral recessed portion of each filter body for bearing against a complementary edge
 30 portion of one of said filter gaskets.

18. The method of claim 15 and further including

assembling a small hole diffuser having a peripheral configuration similar to the peripheral configuration of said filter bodies in the aggregate, when assembled, with said filter housing, and interfitting within said filter housing superimposed over said filter assemblies;

5 interposing a spacer between said filters and said small hole diffuser; and
 engaging a molded coarse hole diffuser, defining a combined diffuser and spacer integrally molded as a single, one-piece unit, with said filter housing in close overlying engagement with said small hole diffuser.

10 19. The method of claim 18 further including cooperatively interfitting said coarse hole diffuser with a plurality of arc plates of an arc diffuser plate assembly, including locating and engaging said coarse hole diffuser relative to said arc plate assembly so as to engage and maintain a plurality of plates of said arc plate assembly in parallel and spaced apart condition.

15 20. The method of claim 15 wherein said mounting comprises receiving filter elements and gaskets within a recessed area of a frame-like, one-piece molded member comprising said filter housing, including cooperatively interfitting with and bearing against edges of said gaskets opposite edges thereof bearing against said filter elements, and said
20 filter housing surroundingly engaging said filter elements, said spacer and said small hole diffuser.

 21. The method of claim 20 further including engaging and seating a peripheral flange of said coarse hole diffuser relative to a complementary peripheral flange portion of
25 said filter housing.

 22. The method of claim 19 and further including positioning and maintaining said arc stack and said filter assembly in assembled relation within said breaker housing, including maintaining compression on said gaskets and maintaining constant assembly
30 force upon said assembly, equalizing compression loading of said gaskets and providing final positioning of the arc stack and filter assembly into the breaker case, utilizing

complementary projections and slots formed respectively on said arc stack, said coarse hole diffuser and said breaker housing.

23. A method of suppressing arcing in a circuit breaker comprising:

5 a method filtering a high energy arc comprising:

mounting at least two filter assemblies with a generally rectilinear filter housing having at least two filter mounting zones so as to define, in the aggregate, a filter assembly;

sealingly engaging said filter body relative to said filter housing in response to
10 forces encountered by said filter assembly both during assembly and in operation;

assembling a small hole diffuser having a peripheral configuration similar to the peripheral configuration of said filter bodies in the aggregate, when assembled, with said filter housing and interfitting within said filter housing superimposed over said filter assemblies;

15 interposing a spacer between said filters and said small hole diffuser; and

engaging a molded coarse hole diffuser, defining a combined diffuser and spacer integrally molded as a single, one-piece unit, with said filter housing in close overlying engagement with said small hole diffuser; and

a method for diffusing said arc, comprising:

20 positioning and maintaining said arc stack and said filter assembly in assembled relation within said breaker housing, including maintaining compression on said gaskets and maintaining constant assembly force upon said assembly, equalizing compression loading of said gaskets and providing final positioning of the arc stack and filter assembly into the breaker case, utilizing complementary projections and slots formed respectively
25 on said arc stack, said coarse hole diffuser and said breaker housing.

24. A filter assembly comprising:

means for mounting at least two filter assemblies with a generally rectilinear filter housing having at least two filter mounting zones so as to define, in the aggregate, a filter
30 assembly; and

means for sealingly engaging said filter body relative to said filter housing in response to forces encountered by said filter assembly both during assembly and in operation.

5 25. The assembly of claim 24 wherein said means for sealingly engaging includes means for interfitting a filter gasket comprised of a silicone material with each filter element.

 26. The assembly of claim 25 wherein said means for sealing includes means
10 for positioning peripheral recessed portion of each filter body for bearing against a complementary edge portion of one of said filter gaskets.

 27. The assembly of claim 24 and further including:
 means for assembling a small hole diffuser having a peripheral configuration
15 similar to the peripheral configuration of said filter bodies in the aggregate, when assembled with said filter housing, and for interfitting within said filter housing superimposed over said filter assemblies;

 means for interposing a spacer between said filters and said small hole diffuser;
 and
20 means for engaging a molded coarse hole diffuser, defining a combined diffuser and spacer integrally molded as a single, one-piece unit, with said filter housing in close overlying engagement with said small hole diffuser.

 28. The assembly of claim 27 further including means for cooperatively
25 interfitting said coarse hole diffuser with a plurality of arc plates of an arc diffuser plate assembly, including means for locating and engaging said coarse hole diffuser relative to said arc plate assembly so as to engage and maintain a plurality of plates of said arc plate assembly in parallel and spaced apart condition.

30 29. The assembly of claim 24 wherein said means for mounting comprises means for receiving filter elements and gaskets within a recessed area of a frame-like, one-piece molded member comprising said filter housing, including means for cooperatively

interfitting with and bearing against edges of said gaskets opposite edges thereof bearing against said filter elements, and said filter housing, including means for surroundingly engaging said filter elements, said spacer and said small hole diffuser.

5 30. The assembly of claim 29 further including means for engaging and seating a peripheral flange of said coarse hole diffuser relative to a complementary peripheral flange portion of said filter housing.

10 31. The assembly of claim 28 and further including means for positioning and maintaining said arc stack and said filter assembly in assembled relation within said breaker housing, including means for maintaining compression on said gaskets and maintaining constant assembly force upon said assembly, for equalizing compression loading of said gaskets and for providing final positioning of the arc stack and filter assembly into the breaker case.

15 32. A circuit breaker assembly comprising:
 means for filtering a high energy arc comprising:
 means for mounting at least two filter assemblies with a generally rectilinear filter housing having at least two filter mounting zones so as to define, in the aggregate, a filter
 20 assembly;

 means for sealingly engaging said filter body relative to said filter housing in response to forces encountered by said filter assembly both during assembly and in operation;

 means for assembling a small hole diffuser having a peripheral configuration
 25 similar to the peripheral configuration of said filter bodies in the aggregate, when assembled, with said filter housing and interfitting within said filter housing, superimposed over said filter assemblies;

 means for interposing a spacer between said filters and said small hole diffuser;
 and

30 means for engaging a molded coarse hole diffuser, defining a combined diffuser and spacer integrally molded as a single, one-piece unit, with said filter housing in close overlying engagement with said small hole diffuser; and

means for diffusing said arc, comprising:

- means for positioning and maintaining said arc stack and said filter assembly in assembled relation within said breaker housing, including maintaining compression on said gaskets and maintaining constant assembly force upon said assembly, equalizing
- 5 compression loading of said gaskets and providing final positioning of the arc stack and filter assembly into the breaker case.

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